

CLAIMS

What is claimed is:

1. 1. A method for fabricating a magnetoresistive sensor
2. comprising:
 3. a) providing a magnetoresistive structure including one
4. or more ferromagnetic layers;
 5. b) disposing a mask between the magnetoresistive
6. structure and an ion source, wherein the mask covers
7. selected portions of the magnetoresistive structure to
8. define a sensor; and
 9. c) exposing one or more unmasked portions of the
10. structure to ions to substantially reduce or
11. eliminate a magnetoresistance of the unmasked
12. portions substantially near room temperature while
13. leaving the magnetoresistive structure substantially
14. intact.
1. 2. The method of claim 1, wherein the ions irradiate
2. one or more ferromagnetic layers in the unmasked
3. portions of the magnetoresistive structure.
1. 3. The method of claim 1, wherein the ions are
2. implanted into one or more ferromagnetic layers in
3. the unmasked portions of the magnetoresistive
4. structure.
1. 4. The method of claim 1 wherein ferromagnetism of one
2. or more ferromagnetic layers in the unmasked
3. portions of the magnetoresistive structure is
4. substantially reduced or eliminated, substantially
5. near room temperature.
1. 5. The method of claim 1 further comprising, prior to
2. c), sputtering the unmasked portions, wherein

3 shadowing by the mask forms one or more tails,
4 wherein the tails are exposed to ions in c).

1 6. The method of claim 1, wherein the mask is a contact
2 photolithographic resist mask.

1 7. The method of claim 1, wherein the mask is a contact
2 electron beam resist mask.

1 8. The method of claim 1, wherein the mask is a stencil
2 mask.

1 9. The method of claim 1, wherein the ions are
2 projected through a mask and focused onto the
3 magnetoresistive structure.

1 10. The method of claim 1 allows widths of the
2 magnetoresistive sensor between about 5nm and about
3 200nm.